



Forest Insect & Disease Leaflet

Black Pineleaf Scale



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Black pineleaf scale *Nuculaspis californica* may attack several pine species and on rare occasions Douglas-fir and white fir.

Scale insects look different from the typical insects we generally encounter. Many people do not recognize these scales as insects, because they are usually small, immobile, and have no visible legs or antennae. Scale insects attach themselves to the host plant, insert their mouthparts into the vascular system for feeding, and then cover themselves with a waxy shell or scale. The outside hard scale cover protects the insect as it feeds on the host plant.

Importance: Sap loss due to scale insect infestations may cause yellowing or wilting of needles, stunting of the needles and an unhealthy tree appearance. Heavy infestations, over several years, may lead to death of all or portions of the tree. Black pineleaf scale outbreaks have often been associated with stressful growing conditions of the host tree caused by drought, soil compaction, root injury, over watering, and other factors that affect plant health. Additional stress associated with scale infestation may result in other insects and/or diseases attacking the trees in urban forests such as pine engraver (*Ips*) beetle. Black pineleaf scale populations often infest individual trees and usually do not rapidly colonize nearby host trees.



Black pineleaf scale on Austrian pine

Biology: Although the black pineleaf scale life cycle has not been studied in Utah, studies of this insect have been conducted in Colorado. Insect development in Utah should be similar to Colorado. The insect generally over-winters as a partially developed scale. Eggs and immature nymphs (crawlers) likely appear in June or July, depending upon temperature. If there is a second generation, egg hatch and crawlers may appear again in late summer. Crawlers move around on the needles or tree bark for several days before permanently settling down on the needles to feed. After egg hatch, the crawler stage and very young scale insects are the life stages most susceptible to control measures. Crawlers usually insert their mouthparts and begin to feed along the flat inner surfaces of young needles. Once they begin to feed the crawlers secrete a waxy covering that enlarges with subsequent molts to accommodate their growth. The black pineleaf scale covering is generally grayish black with a lighter colored spot in the center of the scale. This covering differentiates this insect from another common scale on pine, the pine needle scale *Chionaspis pinifoliae*, which has a uniformly narrower and whitish covering.



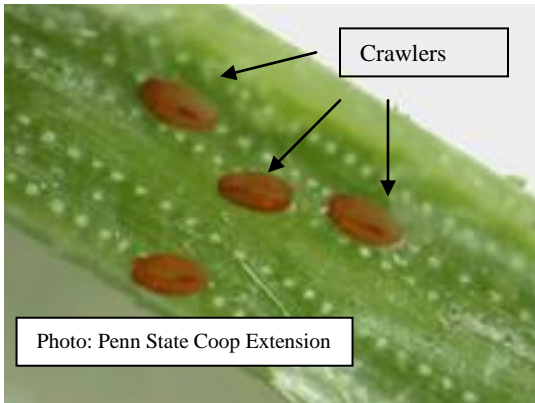
Black pineleaf scale greatly enlarged

Control: Maintaining the health and vigor of susceptible trees is the best approach to minimizing damage caused by this insect. The principle stress factor increasing susceptibility of host trees is generally water related stress. Watering requirements depend upon soil composition and root development. Larger, established trees, should receive a deep watering (2 - 4 inches of water) once every 3 - 6 weeks, depending upon soil composition and its ability to retain

water. Most of the water should be applied at the trees drip line near the edge of the branches continuing to water several feet past the drip line. The top 18 inches of soil should remain moist, but not soaked. Over-watering trees can be just as damaging as under-watering. If water continually accumulates around the tree or the area is always extremely wet, then over watering is occurring. Trees currently under stress often require 2 to 3 years to recover from stress-induced events.

Under natural conditions, predators such as lady beetles, green lacewings, and/or tiny parasitoid wasps usually suppress scale populations enough that insecticide use is unnecessary. However, scale populations may thrive where natural enemies are scarce or natural enemy populations have been reduced by adverse weather conditions or broad-spectrum pesticide applications.

Since the best time to control this insect is during the crawler stage, determining when the insect is in this



stage is important for timing treatments. To determine if this stage is present, gently tap a scale-infested stem or leaf over a sheet of white paper (usually in June or July). If crawlers are present, they will fall onto the paper, where you can easily see them moving around.

Horticultural oils are a more selective control and pose less risk to natural enemies of scale insects. Horticultural oils are effective at killing all life stages. However, a few plant species are sensitive to horticultural oils and the application may cause damage to the needles. Plants under drought stress could be more prone to injury from horticultural oil applications.

Many insecticides and insecticidal soaps are labeled for scale insect control. Timing an insecticide application properly is critical to ensure a successful treatment. New crawlers form a waxy covering rather quickly and may be protected from insecticide applications. Most contact insecticides cannot penetrate the waxy covering on scale nymphs and adults. Crawlers are the life stage most susceptible to these types of treatments. Failure of contact sprays often results from not timing the applications to coincide with crawler activity. Spray the plants thoroughly covering all needle surfaces to the point of run-off. Using a sticker-spreader may increase coverage and efficacy. Several systemic insecticides are also labeled for control of scale infestations. Emamectin benzoate has been shown to be one of the most effective, use as bark treatment or soil treatment is effective as a preventative, or at early to mid-infestation. Reapplications of an insecticide treatment may be necessary. If more than 60% of the foliage has been shed, then the tree may be beyond saving. Therefore, pesticide treatments may not be able to reverse the effects of the insect.

Always use EXTREME CAUTION when applying pesticides/insecticides. Always follow label instructions and safety recommendations.

For further information please contact:



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